

What is claimed is:

1. A method for producing a steel alloy with retained austenite comprising the acts of:
providing a steel alloy;
annealing, following said step of providing, said steel alloy at an annealing temperature to produce austenite in said steel alloy;
quenching, following said step of annealing, said steel alloy at a temperature to transform at least a portion of said austenite into martensite;
carbon partitioning, following said step of annealing, said steel alloy to transfer carbon from said martensite to said austenite; and
cooling, following said step of carbon partitioning, said steel alloy to a desired temperature.
2. A method, as claimed in claim 1, wherein:
said step of providing comprising providing a low-carbon steel alloy.
3. A method, as claimed in claim 1, wherein:
said step of annealing comprising placing said steel alloy at a temperature greater than a temperature for full austenization.
4. A method, as claimed in claim 1, wherein:
said step of annealing comprising placing said steel alloy at an intercritical temperature that is at or above the temperature at which austenite begins to form and below the temperature for full austenization.
5. A method, as claimed in claim 1, wherein:
said step of quenching comprising placing said steel alloy at a temperature below the temperature at which martensite starts to form.
6. A method, as claimed in claim 1, wherein:
said step of quenching comprising placing said steel alloy at a temperature at which martensite forms.

7. A method, as claimed in claim 1, wherein:
said step of carbon partitioning comprising placing said steel alloy at a temperature at which there is carbon mobility.

8. A method, as claimed in claim 1, wherein:
said step of carbon partitioning comprising placing said steel alloy at a temperature above which martensite starts to form.